SCIENCE NEWS

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SCIENCE IN 1928

PHYSICS

THE cosmic rays which bombard the earth from outer space are evidence of the continuous creation of common elements out of electrons there, Dr. R. A. Millikan and Dr. G. Harvey Cameron, of the California Institute of Technology, announced.

The Michelson-Morley experiment was repeated by Professor A. A. Michelson, at Mount Wilson Observatory, with much improved apparatus, and he announced that no motion of the earth through the ether of space could be detected.

Experiments with a thin film of gold conducted by Professor George P. Thomson, of the University of Aberdeen, demonstrated that a stream of electrons contains waves, which may be the electrons themselves or may accompany the real electrons.

Ultra-violet rays in sunlight are responsible for the ionization of the upper layer of the earth's atmosphere which is connected with the Kennelly-Heaviside layer that reflects radio waves downwards, thus making long-distance radio communication possible, announced Dr. E. O. Hulburt, of the U. S. Naval Research Laboratory.

The hypothetical element, "coronium," visible in the sun's corona during eclipses, may be identical with the rare gas argon, indicated by experiments of Dr. Ira M. Freeman, of the University of Chicago.

The highest electrical potential ever achieved by man, more than 5,000,000 volts, was obtained by Dr. Gregory Breit and Dr. M. A. Tuve at the Department of Terrestrial Magnetism of the Carnegie Institution of Washington.

X-rays produced at the California Institute of Technology, with an electrical force of a million volts, by Drs. S. C. Lauritsen and R. D. Bennett, showed the way towards artificial production of cosmic rays.

"Artificial lightning," at a potential of 3,600,000 volts, was generated at the Pittsfield laboratory of the General Electric Company.

Super-sonic waves, which are sounds vibrating too rapidly to be audible, were brought under such control that their action could be studied under a high-power microscope by Professor E. Newton Harvey, of Princeton, and Alfred L. Loomis, of Tuxedo, N. Y.

Inaudible sound waves, nicknamed the "death whisper" because they kill small organisms in water, were produced at the unprecedented rate of two and one half million per second in the private laboratory of Alfred L. Loomis at Tuxedo Park, N. Y.

Sheets of iron, gold and other metals so thin as to be transparent, were prepared by Dr. Carl Mueller, of Charlottenburg, Germany.

Penetrating radium rays were used to test metal castings for flaws at the Russian State Radium Institute, Leningrad.

That helium gas leaks slowly through glass, even through high-quality pyrex, was demonstrated by experiments conducted by three Harvard scientists.

The use of exploding gas in rockets as a propulsive force for automobiles was successfully demonstrated in Germany by Fritz Opel.

The first actual measurements of the speed of lightning showing that it takes about one seven thousandth of a second to complete itself and that it starts from the cloud and the ground at nearly the same instant, the two ends uniting in mid-air approximately one seven thousandth of a second later, were determined by Professor C. V. Boys, the British physicist.

Outdoor television was pronounced possible through use of an extra large lens, with an extra large scanning disc, and extra large holes, all of which results in more light being picked up and focused on the surface of the sensitive cell, in a report to the Optical Society of America, by Dr. Frank Gray and Dr. Herbert Ives.

The development of talking motion pictures was continued and several photo-dramas with complete dialogue and no printed titles were produced.

A million-volt cathode ray tube, equivalent in radiating power to a ton of radium, was built by Dr. W. D. Coolidge, of the General Electric Company.

An improved cathode ray tube, simpler than an X-ray tube, was perfected by Dr. C. M. Slack, of the Research Department of the Westinghouse Lamp Company, making it possible for any well-equipped research laboratory to have at its disposal the important cathode rays.

A high-power short-wave vacuum-tube able to light electric lamps without touching them was demonstrated in the laboratories of the General Electric Company, Schenectady, N. Y.; it heats flesh and blood in its vicinity, and can cause an artificial fever of 100 degrees Fahrenheit.

Two Swiss physicists, Dr. A. Piccard and Dr. E. Stahel, performed an ether-drift experiment with negative results.

A new X-ray moving picture camera which can be set to take pictures at regular intervals was invented by Arthur C. Pilsbury, of Berkeley, California, and believed to have important possibilities in showing inner processes, such as the knitting of broken bones.

A red neon arc light, claimed to be capable of shining through fog, and intended for airport beacon use, was invented by Dr. Clifton G. Found, of the General Electric Company, in collaboration with J. D. Forney, of the Cooper-Hewitt Electric Company.

A magnetic method of detecting flaws in steel castings as large as five or six inches thick was reported by Alfred V. de Forest, of Bridgeport, Conn.

A new metal so hard that it bores smooth holes in concrete, or cuts screw threads in a glass rod, was produced from a compound of tungsten and carbon and cobalt by Dr. Samuel L. Hoyt, of the research laboratory of

the General Electric Company, and given the name carboloy.

A new camera, which makes photographs that appear solid to the eyes and which shows different sides of the object depending on the angle from which the picture is viewed, was exhibited to scientists by its designer, Dr. Herbert E. Ives, the inventor of the method being Dr. C. W. Kanolt.

A triple film which would enable the amateur to make color snapshots with ordinary light and an ordinary camera was announced by F. J. Tritton, a British scientist.

Natural color movies that every one can make and project were developed by the Eastman Kodak Company under the direction of Dr. C. E. K. Mees.

The Congressional Gold Medal was conferred on Thomas A. Edison by action of Congress and presented by Secretary of the Treasury Mellon at the Edison Laboratories, October 20.

The Optical Society of America celebrated the fiftieth anniversary of Professor Albert A. Michelson's first announcement of his determination of the velocity of light by naming its annual meeting the Michelson Meeting.

A medal to be awarded annually by the Optical Society of America, for outstanding work in optical science was founded by Dr. Herbert E. Ives, of the Bell Telephone Laboratories, in honor of his father, Frederic E. Ives, inventor of the half-tone process and other photographic methods.

Chemistry

Gluconic acid, a chemical hitherto obtainable only at a price of $100 a pound, was produced at 35 cents a pound by chemists at the Color Laboratory of the U. S. Department of Agriculture, using a species of mould growing on a glucose solution.

Edible fats and fatty acids for soap-making were made from paraffin through catalytic methods developed by the chemists of the German Dye Trust.

A magnetic theory of catalytic action in which molecules and atoms are conceived as having two poles like a bar magnet was advanced by Dr. Karl Krauch, German chemist.

Wall-board is being manufactured from corn-stalks in a special semi-commercial plant set up at Ames, Iowa, by the U. S. Bureau of Standards in cooperation with Iowa State College.

A commercial plant for making paper out of corn-stalks was built in Illinois, the first of its kind.

The process for converting wood waste into an edible carbohydrate suitable for hog food devised by Dr. Friedrich Bergius, German chemist, was improved to the point of semi-commercial production.

The U. S. Bureau of Chemistry and Soils has evolved two methods of making from corn-cobs insulating briquettes to be used as a substitute for cork, especially in small refrigerating units.

A successful substitute fabric has been developed to replace goldbeater's skin in the making of gas cells for airships, and several months' use in the *Los Angeles* shows the new material to be cheaper and fully as good.

Anthraquinone, a basic raw material in the manufacture of dyes, was made by cheaper methods involving the use of catalysts or solution in furfural as a result of research by Dr. A. O. Jaeger, of Pittsburgh.

New methods of making artificial rubber were announced in Germany, though the process was not divulged.

A new explosive, known as "radium atomite" and claimed to be superior to T. N. T. or dynamite, was demonstrated to army engineers by Captain H. R. Zimmer, of Los Angeles.

Synthetic sugar, from fructose and glucose, was made by two Swiss chemists, Professor Ame Pictet and Hans Vogel.

"Bios," a vitamin that promotes the growth of yeast, was obtained in pure crystalline form by Dr. W. Lash Miller, of the University of Toronto.

Experiments by dairy experts of the U. S. Department of Agriculture demonstrated that milk exposed to sunlight develops undesirable flavors and odors, whereas milk kept in the dark does not.

"Sunshine pills," consisting of synthetic Vitamin D, made by exposing ergosterol from yeast to ultra-violet rays, were placed on sale in Germany and England as a substitute for cod-liver oil.

An ultra-violet irradiated food was placed on the market, a commercial application of the discovery that ordinary foods exposed to ultra-violet rays promote the formation of healthy bones and teeth in children and young animals.

A new way to preserve ether for as long as eight months, without spoiling or deterioration, was devised by S. Palkin and H. R. Watkins.

A new system of chemical shorthand was developed by Louis A. Leslie, of New York, and Dr. C. A. Jacobson, professor of chemistry at West Virginia University.

The 1928 Nobel prize for chemistry was awarded to Dr. Adolf Windaus, of Göttingen, Germany, for his part in experiments proving that ultra-violet light, either in sunlight or artificially produced, will activate ergosterol and confer on it antirachitic properties.

The Nobel prize award for chemistry, 1927, went to Professor Heinrich Wieland, of Munich, Germany, in recognition of experiments on the complex compounds known as the bile acids.

A gearless auto that changes speed automatically was described to the Society of Automotive Engineers by a French engineer, D. Sensaud de Lavaud.

An instrument defined as a "breathing device," which experts believe will save the lives of men submerged in sunken submarines, has been devised by Lieutenant C. B. Momsen, Chief Gunner C. L. Tibbals, both diving experts, and F. M. Hobson, engineer in the Naval Bureau of Construction and Repairs.

Pulverized coal was applied to the propulsion of seagoing vessels, the initial installation being the U. S. Shipping Board vessel, *S. S. Mercer*.

Radio equipment for communication between the front and rear ends of long freight trains has been installed by the Baltimore and Ohio Railroad for demonstration on that system.

The St. Francis dam, which impounds a large part of the water supply of Los Angeles, burst on March 12, causing a destructive flood.

Deposits of potash large enough to be of economic importance were discovered at two localities in Texas and one locality in New Mexico.

Astronomy

Plans to construct the world's largest telescope, with a concave mirror 200 inches in diameter, were announced by the California Institute of Technology, in cooperation with the Mount Wilson Observatory.

The Bureau of Standards constructed, by a new method, the disc for a huge telescope mirror of optical glass almost a foot thick, nearly six feet in diameter and almost two tons in weight, to be used in the first all-American-made telescope for Ohio Wesleyan University.

The year's first comet was discovered on Washington's birthday by a German astronomer, Dr. K. Reinmuth, of Heidelberg.

The year's second comet was discovered on St. Patrick's day by a Frenchman, M. Giacobini, of the Paris Observatory.

The third comet of the year was discovered by David L. Forbes, an astronomer at Capetown, Africa, on November 21, when it was observed in the constellation of Corvus, the crow.

The nucleus of our galaxy of stars was located by Dr. Harlow Shapley, of the Harvard College Observatory, who announced that it is about 47,000 light years away from the earth and extends for about fifty degrees along the Milky Way in the constellations of Sobieski's Shield, Ophiuchus, Sagittarius, Scorpion, the Southern Crown, the Altar, the Rule and the Centaur.

The presence of free oxygen in the atmosphere of Mars is best evidence for the existence of life there, Professor H. N. Russell, of Princeton, declared.

Nova pictoris, the "new" star which flashed out in May, 1925, continued to behave in a very different manner from usual novae, leading astronomers to the view that it might be due to an actual collision of two stars.

The Carnegie Institution of Washington has published the "San Luis Catalogue of 15,333 Stars," marking the completion of the first division in its general catalogue of all stars out to the seventh magnitude.

Evidence was brought forward at the Royal Observatory of Rome that our sun is a pulsating or variable star.

By using plates sensitive to infra-red light, a German astronomer, Dr. G. Blunck, succeeded in photographing the sun's corona, a feat hitherto possible only during a total eclipse.

The earth's rate of rotation changes slightly every day, Dr. Benjamin Boss, of the Dudley Observatory, Albany, New York, announced.

Further confirmation of the Einstein theory was announced, as the result of measurements made on photographs taken during the total solar eclipse of 1926.

The presence of a hitherto undiscovered planet, tentatively called "planet O," was announced by Professor W. H. Pickering, of Mandeville, Jamaica, from a study of its supposed perturbations on known planets, but observations with the biggest telescopes failed to confirm it.

Strange bands in the spectra of the light of certain stars may indicate that they are surrounded by meteors and comets, like the solar system, which may serve as fuel to keep the stars going, Dr. Harlow Shapley, of the Harvard College Observatory, declared.

Max Adler, Chicago philanthropist, gave that city a planetarium which will show the stars as seen from any part of the world at any time and the first to be given any city in the United States, though it will not be completed for a year or more.

On photographs made at the Lowell Observatory, Flagstaff, Arizona, of the spectrum of the Northern Lights on July 7 a very prominent line in the red region of the spectrum appeared for the first time, thus opening up a new scientific mystery, reported Dr. V. M. Slipher, director of the observatory, who recorded the phenomenon.

Moving pictures of the planet Jupiter, the first pictures of the kind ever made, were produced by Professor W. H. Wright, of the Lick Observatory, and Dr. C. E. K. Mees, of the research laboratory of the Eastman Kodak Company.

A prize of 5,000 francs was offered in France for the best paper on a means for reaching another planet; the new projected mode of travel is called "astronautics."

Engineering

A method of utilizing for power the difference in temperature between the depths and surface of tropical seas was devised and successfully demonstrated by Georges Claude, the French physicist and inventor.

Busses carrying 26 passengers, with sleeping accommodations, dining and toilet facilities, were placed in operation.

A new stereoscopic apparatus for making contour maps from overlapping photographs was purchased by the government and is expected to revolutionize topographic mapping in mountainous countries.

The Army Air Corps photographed areas in the United States approximating 35,000 square miles for the War Department and other governmental bureaus.

Radio acoustic sound ranging, making possible the locating of ships even in darkness and fog, was developed.

An apparatus called the fathometer for measuring ocean depths by means of echo sounding was perfected and placed in use on 8 boats of the Coast and Geodetic Survey.

A new world's speed record for automobiles was made at Daytona Beach, Fla., by Captain Malcolm Campbell, an Englishman, who was later killed when his car overturned.

Diesel type engines light enough for automobile and airplane use approached the point of commercial practicability.

A new super-fast motion-picture camera, through which film travels at the rate of three miles a minute, was perfected by C. Francis Jenkins, Washington inventor.

Two condemned buildings in Washington were burned to the ground by scientists of the Bureau of Standards in order to test fire-proof safes under actual conflagration conditions.